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No. 4

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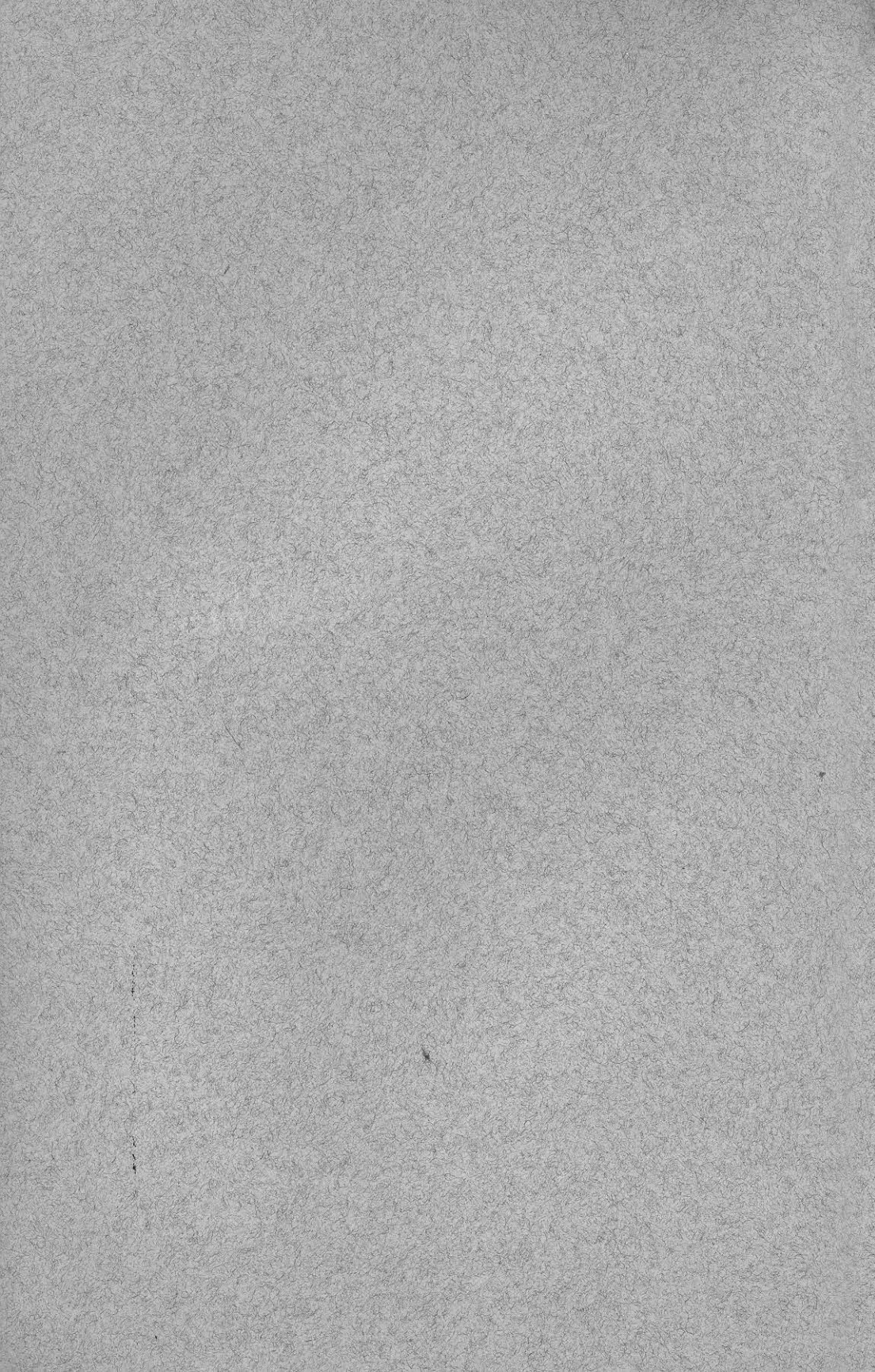
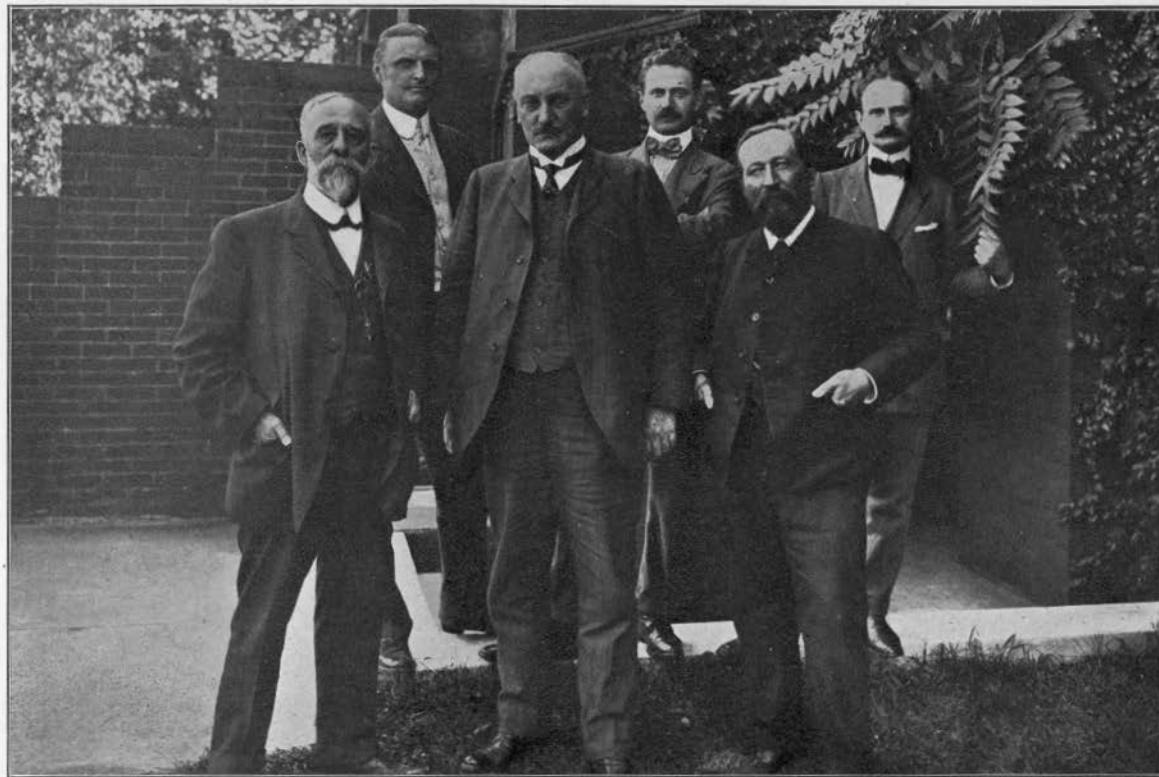


PLATE I



A GROUP OF DISTINGUISHED SCIENTISTS

From left to right, ACTING CHANCELLOR CHARLES E. BESSEY, DEAN H. B. WARD, PROFESSOR RAPHAEL BLANCHARD, BARON DUBRETON, BARON JULES DE GUERNE and BARON LOUIS DUBRETON.

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Oxaluria

BY THOMAS TRUELSEN, OMAHA, NEBRASKA.

INTRODUCTION

In delving about in the literature on oxaluria one is early confronted with observations and statements of the most contradictory character. To some authors oxaluria is a valuable and distinctive clinical designation; others, especially German writers, deny the existence of oxaluria as a clinical entity. Even the physiological aspect is beset with many uncertainties and is almost hopelessly obscure and chaotic.

With your kind permission and charitable indulgence I shall discuss my subject under the following headings:

1, Historical data; 2, definition; 3, chemistry; 4, symptoms; 5, diagnosis; 6, treatment.

HISTORICAL DATA

Donnè is generally given the credit of having discovered the calcium oxalate crystals in urine. The honor, however, is not due him, since Wallaston, 1797 (Trans. Philosoph.), reported that they were usually a constituent of calculi, and two years later Fourcroy (Système de connaissance chimique, 1801) made the ob-

servation that the crystals to which Wallaston referred occurred also independently of calculus formation. These crystals, however, were not recognized as calcium oxalate, but were supposed to be sodium chloride crystals, and to Donnè belongs the honor of having been the first to describe them accurately and to show that they were crystals of calcium oxalate. This he did in 1839. Golding Bird is accredited with having been the first to speak of an oxalic diathesis. In 1842 (*Med. Times & Gaz.*, London) he pointed out that calcium oxalate was a frequent urinary deposit and that symptoms were often associated with this deposition. Another name often seen in reading on oxaluria is that of Begbie. He entertained and advanced the view that oxaluria was due to a poison that was produced by faulty digestion and assimilation, and made harmless or limited in its deleterious effects by being separated from the blood and discharged from the system thru the agency of the genito-urinary organs. One of the most comprehensive papers in opposition to the work done in attempting to establish oxaluria upon a definite clinical basis appeared in 1859 by Gallois (*Compt. rend. Soc. de biol. Paris*). Among other conclusions he says that oxaluria is not a pathologic entity, but a symptom common to very different diseases. It is frequently associated with spermatorrhea, diseases of the nervous system, and especially with dyspepsia.

Much tedious analytical work aiming to establish oxaluria upon a scientific basis was done by Fürbringer (*Arch. f. klin. Med.* 1878). He was the first to show as the result of series of analyses that oxalic acid is a normal and almost constant constituent in the daily urine of healthy persons eating an ordinary mixed diet.

A highly meritorious paper of more recent date, 1896, is that of Dunlop of Edinburgh, entitled, *The Excretion of Oxalic Acid in Urine and its Bearing on the Pathological Condition Known as Oxaluria*.

Another contribution of much valuable assistance in understanding the subject of oxaluria is a paper by Helen Baldwin published in 1900 under the title, *An Experimental Study of Oxaluria with Special Reference to its Fermentative Origin*.

DEFINITION

The concise bit of information that most authors desire to convey by their definition of the term oxaluria varies with their conception and interpretation of the subject, and the common criticism applicable to most definitions is that they are not comprehensive enough. From a consideration of the structure of the term we conclude that it is a convenient contraction to signify the presence of oxalates in urine. The oxalate in question is the oxalate of calcium, and this is often found in normal urine. Some definers, therefore, added "excessive" and "persistent" to their definition, saying that oxaluria is a persistent excessive deposition of calcium oxalate. But even these additions were not sufficiently significant, because there was no escaping the accusation of having raised a symptom to the rank of a disease. It is, therefore, deemed expedient, and the definition covers pretty well our conception of the term oxaluria, to say that it is a condition in which we have, in addition to a persistent excessive deposition of calcium oxalate crystals, a fairly definite complexus of symptoms.

CHEMISTRY

We are all, no doubt, familiar with the appearance of calcium oxalate crystals. The crystals are usually described as occurring in two distinct forms, the octahedral and dumb-bell, each form being frequently seen in some modifying variation. The most common form is the octahedral or so-called envelope crystal, and this occurs in different sizes. The small crystal is said to contain only one molecule of water of crystallization and to occur when precipitation takes place rapidly. The larger octahedra, on the other hand, are said to contain three molecules of water of crystallization and they are about the size of leucocytes. Occasionally a long, pointed, octahedral crystal will be found. These crystals are colorless and highly refractive; they are insoluble in water, alcohol, and acetic acid; heat does not affect them. They are soluble in mineral acids, but without effervescence.

The other form in which calcium oxalate is described as crystallizing is likened to dumb-bells. Recent investigations, however, have established that fact that these dumb-bells are not

an oxalate, but a carbonate, the conclusions being based upon the facts that their solubility differs from that of the octahedra in that they, the dumb-bells, are soluble in acetic acid and effervesce during decomposition, and that, furthermore, they can not be artificially produced unless some substance is added which in decomposing will yield carbon dioxide, as for instance, albumin.

Source.—The investigation of the source of oxalic acid in urine has required much tedious analytical work, both confirmatory and critical, and the many contradictory results recorded are no doubt due to a great extent to the difficulty of making thoroly reliable estimations because of the complicated technic and uncertain tests used. The most popular explanation of the older writers as regards the origin of oxalic acid in urine is that the greater portion is derived from the ingested food articles that contain oxalic acid, and that a small amount is the product of metabolism. Some later authors added that under certain pathological conditions oxalic acid may be formed in the digestive tract during a peculiar fermentation process.

All investigators, both past and present, agree, I think, that the greater portion is derived from the ingested food articles that contain oxalic acid, such as spinach, rhubarb, cocoa, tea, etc. But regarding the production of oxalic acid during the complicated processes of metabolism no such unanimity exists. The theory, however, has many adherents, and they defend their belief by pointing out the close chemical relationship between uric and oxalic acids, the latter being readily obtained from uric acid in laboratory experiments during the processes of oxidation. So far, so good. But a further pursuance of this subject, a consideration of the determining circumstances under which oxalic acid is produced from uric acid in the laboratory, namely, the presence of strong reducing agents, such as nitric acid, render highly improbable, even impossible, the production of oxalic acid in the economy under these circumstances. Yet it does not of necessity follow that oxalic acid may not be produced from uric acid in some other way. But modern observations tend to show that this is not the case, as they tend to prove that the formation of uric acid is quite distinct from the ordinary nitrogenous metabolism during which urea is produced, and that uric acid is not, as was at one time supposed, an intermediate body formed during

the transition of proteid to urea. The principal work showing this is that of Horbaczewski, (*Sitzungsb. d. k. Akad. d. Wissensch., Wien.* 1891), a partial abstract of whose paper I quote from Dunlop:

"He, Horbaczewski, found that there was a production of xanthin bases if the splenic pulp was kept at the temperature of the body for some time and so allowed to decompose, and that if this decomposition took place in the presence of an abundance of oxygen, then, instead of xanthin bases, there was a production of uric acid. A similar production of uric acid has been obtained from the decomposition of other tissues rich in leucocytes. Further, he has shown that the formation of uric acid is proportionate to the amount of leucocytosis taking place in the body, being greatest during leucocytosis of digestion; and from this he deduces the fact that uric acid is derived from the breaking up of the leucocytes. He has also noted an increase of uric acid excretion following the administration of nuclein, both in animals and man, and as nuclein occurs in the nuclei of leucocytes he infers that the uric acid is produced from the nuclein they contain. Nuclein is capable of being decomposed into a proteid and nucleic acid, the nucleic acid further decomposing into its constituent parts, phosphoric acid and xanthin bases, the xanthin bases being oxidized to form uric acid. The derivation of uric acid from the nuclei of the leucocytes is further corroborated by the fact that they are the only cells in the body which occur in sufficient quantity and which undergo sufficiently rapid change to explain the production of uric acid in the quantity in which it is found in urine. The increase of uric acid found in certain diseases also corroborates this, for in leucocythemia and in pneumonia, in both of which there is increased leucocytosis, there is also increased uric acid excretion." From the facts just presented I think it plausibly evident that since uric acid is itself an end-product in the economy and not an intermediate body in the process of metabolism, the theory that oxalic acid is formed from uric acid during metabolic changes by a process of oxidation is no longer tenable.

Another source of oxalic acid—its origin in the digestive tract during a peculiar fermentative process has been experimentally established by Helen Baldwin while working in the C. A. Herter

laboratory in New York. She experimented with dogs. These were dieted until no oxalates could be found in their urines, and then fed excessive quantities of glucose together with meat. Eventually this oxalic-acid-free diet led to an oxaluria, and examinations of gastric contents about one hour after ingestion revealed the presence of oxalic acid, much mucus, and an absence of hydrochloric acid—data of much clinical importance. In another set of experiments water, glucose and beef extract were placed in an incubator and allowed to ferment with the view to determine whether oxalic acid could be produced in this way. The result was negative. But when to this digestive mixture was added a small quantity of the gastric contents of dogs suffering from oxaluria that had been produced by the exclusive dietary use of the glucose mixture, oxalic acid could be demonstrated after the mixture had been in the incubator for two days.

Upon these facts as a basis she drew the following conclusions: "In certain clinical disturbances, which in some of the cases studied above were associated with the absence of hydrochloric acid from the gastric juice, oxalic acid is formed in the organism, and its formation is connected with fermentative activity in the alimentary canal." Of equal clinical importance is her conclusion that this experimental oxaluria is associated with mucous gastritis and absence of free hydrochloric acid from the gastric contents.

Amount—The amount of oxalic acid stated to be present in normal urines varies with different authors. Fürbringer's conclusions that the amount is small, usually less than 0.02 grms. in twenty-four hours urine, are those generally quoted. Under pathological conditions the amount may be greatly increased. These facts, however, are only of scientific value, for the processes involved in the quantitative estimation of oxalic acid in urine are far too difficult and tedious to be of any helpful value for clinical purposes.

Absorption and Precipitation.—Granting, then, that the source of oxalic acid in the economy under ordinary prevailing conditions is to be found in those food articles which contain oxalic acid, and that under pathological conditions its presence in the gastro-intestinal tract may result from, and be augmented by, a peculiar fermentative process, a number of questions at once pre-

sent themselves for solution: Is all oxalic acid absorbed, and what factors influence its absorption? Is it all precipitated, and what factors influence its precipitation?

It is a well-known fact in chemistry that some acids can prevent the precipitation of oxalic acid; contrariwise, calcium salts readily precipitate it. Notable, because of their prohibitive action and therapeutic value in clinical oxaluria, are nitric and hydrochloric acids. Among the organic acids lactic acid must be mentioned. These acids, with the exception of nitric, are active in the processes of normal gastric digestion, lactic acid playing its rôle early, and hydrochloric acid as digestion advances. Their influence upon oxalic acid and calcium oxalate, as in the laboratory so in the stomach, is to antagonize precipitation and thus favor absorption. But it is not all absorbed; in fact, under ordinary conditions the opposing tendencies of the ever-present lime in the ingesta is such that only small quantities are absorbed, the greater portion being precipitated as calcium oxalate and leaving the economy in the fecal matter of which it is a normal crystalline constituent.

For direct experimental evidence substantiating the above facts we are indebted to Dunlop. He found that the administration of sixty minims of dilute hydrochloric acid one half-hour after meals and repeated in one half-hour regularly increases the amount of oxalic acid in the urine; and lactic acid, administered under the same circumstances, corresponding in dosage and time of administration, produced also an increased elimination of oxalic acid. In his experiments, having in view the establishment of the fact that calcium acted in opposition to hydrochloric and lactic acid, its administration in fifteen-grain doses after meals regularly decreased the excretion of oxalic acid. It was, therefore, concluded that during gastric digestion of an ordinary mixed meal we have in the stomach oxalic acid which may or may not be in soluble form; lactic and hydrochloric acids which tend to hold it in solution, thus aiding in its absorption; calcium chloride, which readily precipitates it, thus preventing its absorption—and that the quantity absorbed is the amount that escapes during the adjustment of the above-mentioned chemical influences. Furthermore, recalling the data established by Helen Baldwin, it is to the point to emphasize that during fermentative

oxaluria these chemical influences must be interfered with, as is evidenced by the absence of hydrochloric acid from the gastric juice of her subjects, thus allowing more oxalic acid to be absorbed and eliminated, and offering a most plausible explanation of the *modus operandi* of the use of mineral acids in cases of clinical oxaluria.

The chemical aspects of oxaluria that are presented in the genito-urinary tract are apparently more complex and not so easy of analysis as those encountered in the digestive tract. This, at least, would be the conclusion, if one gathered together and attempted to harmonize 'the many indefinite and contradictory statements of the different authors. Thus we read in the *Twentieth Century Practice of Medicine*, 1895, in a chapter by Harry Fenwick of London, that the development of this salt seems to depend more upon the lime in the urine than upon the oxalic acid. Critical investigation, however, relegates the foregoing statements to the category of assumptions. The facts briefly stated are these: The average amount of oxalic acid excreted daily is less than 0.02 grm., while the average amount of lime is about 0.339 grms. (Bunge), or an amount about twenty times as great as oxalic acid; and the reason that oxalic acid is not precipitated in every case is that acid sodium phosphate exerts a preventive or inhibitory action in this direction, precipitation occurring only when acid sodium phosphate becomes reduced in quantity by being converted into neutral or alkaline phosphate. This view was first entertained and advanced by Moddermann (*Schmidt's Jahrbuch*, Leipzig, 1865) and has since become the explanation generally accepted.

Dunlop's experiments afford confirmatory evidence upon this point. He concludes that acid sodium phosphate is certainly a solvent for oxalate of lime. That it is not a powerful one is evident from the fact that a very considerable percentage of urines contain crystals of calcium oxalate, but one can explain the solution of the small quantity of oxalate which occurs in urine in this way. He says, furthermore, that it may not be the only solvent, a point to be borne in mind when considering the quantitative estimation.

The question whether the deposition of calcium is due to an excessive oxalic acid or to an imperfect solvent has been an-

swered in both the negative and affirmative. Fürbringer (*Arch. f. kl. Med.*, Berlin, vol. 18, 1876) came to the conclusion that a precipitation did not indicate an increase in the amount of acid present; and this opinion, after much discussion, became the accepted one. Recently, however, its orthodoxy has received a severe jolt from the experimental data obtained by Dunlop, who, working with improved facilities and with refinements in technic and tests, found that in those cases in which calcium oxalate was precipitated there was invariably a larger per cent of oxalic acid present than in those cases in which no precipitation occurred, and his conclusion, that we may assume a comparatively large excretion of oxalic acid in those cases that deposit calcium oxalate, provided the quantity of urine is of an average daily quantity, is of scientific value and practical clinical significance.

SYMPTOMS

In studying the symptoms of oxaluria we can quite well and conveniently discuss them as pertaining to the digestive tract, the genito-urinary system, and the nervous system; or we may classify them more simply by dividing them into general and local symptoms. Then, too, the symptoms may be conveniently studied as they occur in acute or transient cases and chronic cases.

Transient cases, also called accidental cases, or those that follow the ingestion of large quantities of substances that are particularly rich in oxalic acid, generally produce no symptoms. When symptoms are produced in these acute cases, if you will permit the term, they are readily referable to the genito-urinary tract and are caused by the irritation that the crystals produce while passing along the tract. Thus we may have an uncomfortable feeling or even pain in the kidneys, along the ureters, or in the bladder. Here the irritating constituents of the urine may give rise to frequent micturition. The duration of the symptoms is not longer than twelve to twenty-four hours, and if no lesion, as for instance a pre-existing nephritis or cystitis has been aggravated, the patients again find themselves in their previous normal condition.

In the chronic cases, also called idiopathic oxaluria, the digestive symptoms most frequently complained of are dyspepsia, flat-

ulency, and constipation, all logical and direct symptoms because of their dependence upon the mucous gastritis and the absence of hydrochloric acid from the gastric juice in these cases. Indirect digestive symptoms are manifold and varied, and their enumeration can well be disposed of by saying that they comprise all the symptoms of chronic catarrhal gastritis, a syndrome with which all are familiar. Symptoms originating in the genito-urinary tract, such as pains in back and loins, irritability of bladder, prostatic hyperemia, sexual derangements of various kinds, etc., are no doubt directly dependent upon "the renal resentment of fixed oxalate concretions or the passage of the sharp irritating crystals along the sensitive urinary passage."

Sometimes nervous symptoms predominate and overshadow the other groups of symptoms. These are the cases that are called oxaluria nervosa. The mild cases present themselves complaining of languor, loss of energy, incapacity for exertion, etc., symptoms probably not due so much to the irritation produced along the genito-urinary tract as to the fermentation and putrefaction in the digestive tract. In the severer cases we are confronted with more pronounced symptoms. These patients are often extremely nervous, painfully susceptible to external impressions, irritable and capricious, and sometimes even hypochondriacal to an extreme degree—a complex of symptoms that testifies to a prolonged irritation along the genito-urinary tract.

DIAGNOSIS

The diagnosis of oxaluria from the consideration of the symptom-complex alone can be only provisional; the diagnosis by chemical tests is impracticable for the busy clinician because of the skilful technic demanded and the very complicated and delicate tests used. The practical microscopist comes to our rescue. The recognition of the crystals is easy, and their presence is usually the predominating feature of the fields examined. Given, then, a heavy deposit of crystals, associated with above discussed symptoms or groups thereof, the diagnosis is readily made, and if, in addition, the urinary findings are constant, the diagnosis becomes a certainty.

TREATMENT

Various lines of treatment have at different times been propounded and advocated, the direction of which usually depended upon the author's conception of the causative factor or factors of oxaluria. Much stress was laid upon dietetics. Those that accepted that oxaluria was due to the ingestion of vegetables rich in oxalic acid, or its calcium salt, proclaimed that no treatment could be logically acceptable that did not contain an injunction against all vegetable vehicles of oxalic acid. A tenet with those who maintained that oxalic acid was an intermediate metabolic product originating during a faulty transformation of a proteid to uric acid was that proteids must be religiously prohibited and avoided. The present status of the dietetic treatment recognizes the needlessness of an injunction against any one class of food-stuffs and allows a liberal mixed diet; and it enjoins upon the patient only that the food be given a thoro oral and molar preparation.

The medicinal agent in the treatment of oxaluria is nitrohydrochloric acid, a remedy par-excellence. Its remedial virtues in oxaluria have been recognized ever since the days when our subject first came into prominence, and its use, empirical in those days, has only recently been placed upon a rational therapeutic basis thru the efforts that established a more accurate conception of the pathologic physiology of oxaluria. So effective is nitrohydrochloric acid in its influence that it may well be called a specific. Just how it exerts its corrective influence I do not know, but I invite your attention once more to the fact that Helen Baldwin in her experimental study of our subject came to the conclusion that it was associated with mucous gastritis and absence of hydrochloric acid in the gastric contents. The administration of hydrochloric acid, then, seems to be rational, and its action is probably merely supplemental. In nitric acid we have a most effective stimulus of the liver. This accessory digestive gland, however, is probably not alone influenced by the administration of nitric acid, and it is certainly quite compatible with clinical results obtained to assume that nitric acid exerts a stimulus upon all the digestive glands. In the mode of administering nitrohydrochloric acid I previously copied after our text-book authors

who state that every few days the acid must be freshly prepared. Results were good. But in order to overcome the necessity of preparing afresh the medicine every few days I have more recently been ordering the nitric and hydrochloric acids in separate containers as before, but directing the patient to drop into a glass of water a certain number of drops of each acid. Whether we dare to designate this solution dilute nitro-hydrochloric acid I do not know, but, be this as it may, results have been just as good as when using the freshly prepared nitro-hydrochloric acid, and this mode has the advantage of ease in increasing or decreasing either acid if the exigency of the case so demands.

When using the nitro-hydrochloric acid of the text-books it will be found more efficacious in a larger dose than there given, five to ten drops well diluted being none too large in bad cases. Sometimes, too, one dose right after meals, and one repeated in twenty to thirty minutes will be advantageous. When directing a fresh mixture to be made for each administration, nitric acid may be used in the dose of three to five drops, and hydrochloric acid in the dose of seven to fifteen drops, and repeated if necessary.

The Hunterian Laboratory of Experimental Surgery

BY ARTHUR C. STOKES, OMAHA, NEBRASKA

It is not hard to recall the fact that the beginning of surgery was anatomy and the teaching of Vesalius, Harvey, the Hunters, and the Monros placed anatomy on a real scientific basis. Surgery, even at the time of Harvey, who was born in 1578, was given up mostly to the barber colleges and was done by a class of men who were outcasts from society, and while Harvey added much to anatomy and surgery he nevertheless was more an internist than a surgeon. He seems to have been the first who placed surgery in the curriculum of the College of Physicians in London, which he was influential in establishing and in which he gave lectures on anatomy and surgery for several years.

Surgery during all these years, even down to the time of the establishment of Kings College in New York, in 1767, (afterwards the Medical Department of Columbia) was only a part of anatomy in the curricula of the medical schools. But under the leadership of John Jones surgery was given a separate chair, the first in the world, and it is said also that the first systematic course of lectures given in the new world on operative surgery was given by Valentine Mott in New York in Columbia College in 1810. He used the cadaver, which was considered a great advance and attracted many students to him, so that as a result of this he was made Professor of Surgery of Columbia in 1811.

It would require volumes to recount the progress made from that day to this in operative surgery, but a few sentences will almost suffice to give an outline of the steps made in teaching. Starting with the small private classes like Hunter's, Bell's, and Monro's, the pendulum swung to the great amphitheater-teaching of the days of Agneu, Ashurst, and Parks, when manual dexterity was the sole consideration and when the doing of "wonderful operations" was regarded as the acme of surgical proficiency. This spirit continued to within a few years of the present day, when it was discovered that this sort of thing did not educate men to the true responsibilities of their calling; that mere observation was not sufficient to make of them successful

and safe men, and that the only men who really learn to do surgery are those who are fortunate enough to obtain either assistant-ships or hospital positions, and that teaching surgery by large amphitheater clinics and didactic lectures was sadly deficient. Hence the pendulum swung the large classes back to the small ones, and we are now beginning to appreciate the value of teaching in small sections where the minute details can be observed. This, however, is still not sufficient to develop the proper spirit and education in the man who would be a surgeon. He should learn first of all, not only in surgery but especially there, to be an investigator, and second he must learn surgical technic by actually doing it. This has been and is the difficulty. Work on the cadaver only partly answers the question. Hence the establishment in a number of our universities of the courses of experimental surgery and the courses of operative technique on animals in order to send out men better qualified to operate, or at least let them know the limitations of their ability.

The Hunterian Laboratory of Experimental Surgery, as it is called at Hopkins, is a building separated from the other buildings of the Medical School. It has two floors. The animals are kept on the ground floor. Those not operated upon are kept in pens or allowed to run in an open yard. After they have been operated upon or experimented with, they are kept apart, and each animal has a separate stall, pen, or kennel. Two "diener" are in constant attendance, and these animals are kept clean, fed and watered with as much care as the feeding of patients in a hospital. Their wounds are bandaged, and the bandage is covered with a thin layer of either plaster of Paris or a prepared cement in order to prevent the dogs and rabbits from biting thru the bandages and tearing off the dressings. The second floor is divided into two parts, one of which is a main operating room kept more particularly for Dr. Cushing's work on technical surgical teaching, but used also for experimental operations. Here everything is arranged for sterilization and practical surgery, just as it is in an ordinary operating room, and here surgical technic is carried out as strictly as it is in any hospital in the land. The remainder of the building is given up to rooms for inoculation, pathological and bacteriological laboratories, and a museum for specimens obtained from animals, i. e. pathological conditions found in animals.

We are all familiar with the many good things that have come out of this laboratory, such as McClure's work on intestinal obstruction, Watt's and Carrel's work on arteries and their surgery, and it does not require a prophet to foresee other things to come equally as good. We are perhaps not all familiar with the fact that this institution has given birth to the first systematic course in operative technic on animals ever given in America (and as far as I know in the world). About five years ago the Johns Hopkins Medical School instituted a method of teaching surgery which is as much of an advance over the methods then used as was the method of Valentine Mott or Langenbeck over that of their predecessors. This course is given to juniors and is optional. The student is required to do a certain number of operations on dogs or rabbits. These operations are done with as much care as is the surgery in the Hopkins Hospital, and each student is drilled in asepsis and in the technic of incisions, sutures, clamping arteries, controlling intestines, draining the peritoneal cavities, and many other points that the students who never have a hospital training entirely miss or know only by hearsay. Here he actually does the things on living animals which he is taught are done on human beings. He is impressed with the idea that he is dealing with a life, and if this animal dies the responsibility is his. Too much emphasis can not be laid on this point. This same work has been done before, especially in Germany, but in such an unsystematic and desultory manner that, except to post-graduates, it amounted to practically nothing. In this country it has been taken up by Harvard University, University of Pennsylvania, and the University of Minnesota, and this year the Dean and Faculty of the Medical Department of Nebraska have decided to institute such a course, and it will be optional and given to juniors at Omaha. I can not close this article without mentioning one other thing which is being accomplished by the Hunterian Laboratory, viz., it has become a veterinary hospital where all sorts of operations are made on dogs for surgical diseases, which before the introduction of this laboratory were let alone, so that the animals succumbed. I may mention exophthalmic goiter, ununited fractures, intestinal obstructions, sarcomata, and carcinomata of viscera and limbs, brain tumors, and the like. Veterinary surgeons bring animals from various parts of the

country here to have these operations performed, and the work has opened up a new field that I shall term comparative surgery, by which our knowledge of comparative pathology will be vastly broadened within the next decade. If, then, I were to state in résumé the work done by the Hunterian Laboratory at Hopkins, I would say its chief advance lay along three lines, two of which are new: 1, researches in surgery; 2, a new method of teaching surgery; 3, the extension of our knowledge of comparative anatomy and pathology.

By emphasizing these last two points the laboratory attempts to educate the students who leave the University to the proper spirit of surgery, that it is only a part of medicine in general. It is only manual therapeutics and can never rise to the dignity of diagnosis and treatment; that altho it is only a branch of medicine, it is a very important one and should not be undertaken unless done with careful consideration, proper study, and proper training. It is not a commercial business, and should never be undertaken with the idea of gain. It is to be used only when occasion demands and an investigation has shown that the patient's life is the more likely to be preserved by surgical interference.

The Clinical Conference in the Teaching of Medicine

BY W. O. BRIDGES, OMAHA, NEBRASKA

The introduction of the so-called conference hour in the course of medical study for advanced students has been a decided step toward the perfection of the medical training. Inspection of many of the higher grade college curricula of today will find it occupying a prominent place, especially in the departments of medicine and surgery.

The conference hour as usually applied consists in a conference between teacher and a class on some previously designated subject, the literature of which has been looked up by all and a general discussion covering the entire ground is held, with the instructor as guide and critic. Or, the history of a given case is cited by either teacher or student, to be followed by analysis of detail in symptoms, etiology, pathology, etc. Two years ago the Department of Medicine in the University, in adopting the conference hour system, went a step farther and introduced the clinical conference hour. As a basis for this work for each conference, two students are assigned to a selected case in the hospital or the home. They are required to take a detailed history, make a thoro examination, work out laboratory findings of the blood and urine or pathological secretions, and report in writing at a conference hour four or five days later, the one taking up the clinical history, etiology, pathology, and diagnosis, the other differential diagnosis, prognosis, and treatment of this particular case. The reports are thereupon made the subject of analysis and criticism, the entire class participating under the guidance of the instructor. The papers are then examined and graded, the marks entering into the finals at the end of the semester. The interest on the part of the student, the working out of the details, the collateral reading, and the spirit of rivalry manifested, all tend to establish a habit of systematic work and a spirit of self-confidence on the part of the student which better paves the way for the post-graduate days. The following report, as actually submitted, may serve to illustrate the method:

CASE EXAMINED AND REPORTED BEFORE THE CLASS DURING THE
CONFERENCE HOUR OF DR. W. O. BRIDGES AT THE COLLEGE
OF MEDICINE, FEBRUARY, 1907, BY J. M.
WOODARD AND E. M. WARE

I

Mrs. K., age 39, American, married, has had five children, youngest one being five years old, one miscarriage.

FAMILY HISTORY.—Father living, age 72 years, in fair health; has rheumatism. Mother living, age 71 years, has some chronic lung affection. One brother died in early life from scrofula. One brother has malaria and gall stone trouble. One sister has "lung trouble."

PREVIOUS HISTORY.—She had measles, whooping cough, and pneumonia in early life. At thirteen years of age an abscess appeared on her chest over the sternum at about the junction of second or third costal cartilage. She had cystitis at sixteen.

PRESENT HISTORY.—Menstruation has been irregular for about two years, occurring at varying intervals of two to four months. She had chilly sensations during the past winter. Appetite variable, and she has lost strength progressively. About October 1 she noticed a growth in left upper abdomen about the width of three fingers. It had a smooth surface and on sitting up or bending forward she would have a dull pain located at the border of the left costal arch. She also noticed shortness of breath. This growth has been gradually increasing in size. Her sleep was impaired owing to shortness of breath and restlessness. Weakness was extreme. She had to give up her housework, and about the 1st of November, 1906, had become so weak that she had to be dressed and undressed. During November she had profuse night sweats. She has been confined to her bed most of the time. She feels better lying down.

Five weeks ago she developed a pneumonia in the left lung. No pain complained of, but she had cough, fever, tenacious sputum streaked with blood. At the end of the third week (two weeks ago) she was taken with a severe pain in the upper right lung. The pain was so severe that breathing was difficult. Sputum again became tenacious and streaked with blood. Had some

cough and fever. The patient still coughs, sputum tenacious but not streaked with blood, and runs an afternoon temperature ranging from $101^{\circ}.4$ to $102^{\circ}.6$ F.

PHYSICAL EXAMINATION.—(1) *Inspection*. Extremely emaciated, marked pallor. Right and left supraclavicular and infraclavicular spaces depressed. Pulsation of vessels of neck. Respiration movements less pronounced on the right upper anterior chest. Apex beat visible in the fourth interspace in midclavicular line. Left side of chest and left costal arch more prominent than the right. Abdomen greatly distended, more prominent on the left side. Tumor-like mass is seen to move up and down with respiration. Distended veins over lower abdomen.

(2) *Palpation*. Vocal fremitus more marked over right chest, especially above the clavicle. Apex beat palpated in fourth interspace in midclavicular line. Tumor mass felt on left side at costal arch under the seventh rib extending downward and to the right. At the level of the umbilicus it is one inch to its right, extreme right lower border is two inches to the right and six inches below the umbilicus. It completely fills the left half of the abdomen from costal arch to the pelvis. The mass feels hard with a sharply defined right border. On this border are felt three distinct notches. One just above and a little to the right of the umbilicus, another just below and to the right, and the third two and one-half inches below the umbilicus and to the right. Liver is slightly enlarged.

(3) *Percussion*.—Right lung, dulness over upper lobe. Left lung, slight dulness above, anteriorly and posteriorly.

(4) *Auscultation*.—Right lung. Bronchial breathing over apex to third rib and spine of scapula with moist râles. Left lung; few subcrepitant râles in suprascapular and clavicular regions with prolonged expiration.

BLOOD EXAMINATION.—Hemoglobin, 70 to 75 per cent. Red cells, 3,166,000; white cells, 306,000; color index, 1. Differential count: Polymorpho-nuclears, 62 per cent. Lymphocytes, 7.5 per cent. Myelocytes, 25 per cent. Transitional, 4 per cent. Normoblasts present.

URINE EXAMINATION.—Specimen cloudy, on heating cleared up. Specific gravity 1020. Reaction acid; albumen, sugar, bile, negative. Uric acid crystals present. No casts.

DIAGNOSIS.—Spleno-myelogenous leukemia with pneumonia of right lung apex, stage of consolidation, and of left apex stage of resolution, possibly tuberculous.

J. M. WOODARD.

II

DIFFERENTIAL DIAGNOSIS.—Spleno-myelogenous leukemia is to be differentiated from the other forms of essential anemia, viz., pernicious anemia, splenic anemia, and lymphatic leukemia. The differential diagnosis is based on the physical examination, symptoms, and blood findings.

In pernicious anemia there is often a history of periods during which the patient seems greatly improved. The skin has a characteristic icteroid or lemon tint. The spleen is often not enlarged or only slightly so, and gastro-intestinal disturbance is more common. The blood examination shows a high color index often plus 1. The reds are greatly decreased, often less than 2,000,000 per cubic centimeter. Poikilocytosis is marked, normoblasts are numerous, and megaloblasts are often found. The white cells are never increased, but often decreased. A differential count shows a relative increase in the small lymphocytes; only a few myelocytes are found.

In lymphatic leukemia the superficial lymph glands are enlarged, especially those of the inguinal, axillary, and post-cervical regions. The spleen is usually enlarged but rarely to the degree found in the present case. The lymphocytes constitute a large percentage of the white cells, amounting to 90 per cent. Eosinophiles and normoblasts are rare.

In splenic anemia we depend on the blood findings for our diagnosis, as the symptoms and physical findings are often much the same. The number of reds is much more reduced, and the white cells, instead of being increased, are reduced; only a few or no myelocytes are found and the small lymphocytes are relatively increased.

Pneumonia in the stage of resolution is to be differentiated from (a) bronchitis, (b) acute pulmonary tuberculosis. (a) That the trouble is more than a bronchitis is proven by the history of the attack, the sudden sharp pain in the side, the dyspnea,

cough, character of the sputum, fever, the increase of chlorides in the urine. (b) As to acute pulmonary tuberculosis, beginning at the time, no absolute differentiation can be made at present. The points against tuberculosis are: (1) repeated examinations show no tubercle bacilli in sputum; (2) the general condition of the patient is gradually improving; (4) chlorides in the urine are increased; (5) the cough is diminishing.

The diagnosis of pulmonary tuberculosis which antedates the recent attack of pneumonia can not be made absolutely, for nearly all of the points upon which a diagnosis is based can be accounted for on other grounds. The afternoon fever may be due to the leukemia, as fully three-fourths of all cases show some fever at times. The night sweats could be accounted for by the weakened and debilitated condition of the patient.

PROGNOSIS.—The prognosis as to recovery is bad, most cases terminating fatally in from two to five years. Should the subsequent history prove tuberculosis to be present, the prognosis as to duration of life is much less favorable. It would probably run a rather acute course and would result fatally in from six months to a year.

TREATMENT.—(1) *Hygienic*. The room should at all times be well ventilated to insure a constant supply of fresh air. She should avoid exercising beyond her strength. Sleep should be regular and encouraged by ten grains of trional at bedtime if necessary. (2) *Dietetic*. The diet should be nutritious and at the same time easily digested. Pork, cabbage, and pastries should be avoided. Between meals and at bed time crackers and a glass of milk should be given. (3) *Medicinal*. As a general tonic strychnia (grains 1/40 t. i. d.) should be given. The bowels should move at least once daily, procured by the use of Cascara or salines daily with an occasional dose of calomel if required. For the night sweats she should try alum, one dram in alcohol, one pint, used as a hand bath at bedtime. For the treatment of the leukemia *per se* arsenic, in the form of Fowler's solution, should be given, beginning with M. V., t. i. d., p. c., and gradually increasing to the point of tolerance. As soon as the patient gains in strength she should begin to take X-ray treatment under some one well versed in this line of treatment.

E. M. WARE.

THE BULLETIN

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COLLEGE OF MEDICINE

HENRY B. WARD, Dean, Lincoln

HAROLD GIFFORD, Associate Dean, Omaha

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EDITORIAL

On September 11 and 12 the University was visited by a group of distinguished Frenchmen. The party consisted of Professor Raphael Blanchard, Baron Jules de Guerne, Baron Dubreton, and Baron Louis Dubreton. They had come to the United States, as delegates and participants, for the Seventh International Zoological Congress, and at its close had taken part in the series of excursions to New York, Philadelphia, and Washington which were planned to give the foreign delegates an adequate view of the great eastern centers and their educational institutions. After this round of festivities they entered upon an independent trip with the object of broadening their knowledge of the country and its institutions. The stop at Lincoln was made en route to the Pacific coast, and for the express purpose of examining a typical state university of the most progressive sort. They spent two days in a study of some features especially connected with the scientific work of the University in biological lines, and expressed themselves in highly appreciative fashion of the organization and conduct of this side of the institution.

The College of Medicine proved particularly interesting to the leader of the party, Professor Blanchard. This was to be expected since he is himself a prominent member of the Faculté de Médecine of the University of Paris. His wide reputation has been well earned by important contributions to medical zoology, especially in the field of parasitology. He is the author of the greatest treatise in French on this subject, and the list of his less extensive articles touches every phase of the relations of animals to medicine. He is also founder and editor of the *Archives de Parasitologie*. In addition to the numerous honors bestowed upon him by institutions and scientific societies at home and abroad, he has received public recognition in France, having been chosen Chevalier of the Legion of Honor. As general secretary of the International Zoological Congresses he is the single permanent officer of these bodies and has achieved signal success in extending their influence and prestige. Of commanding presence, handsome, genial, and intellectual he is a true representative of the highest type of Frenchman. His work as director of the laboratory of parasitology at Paris and as investigator and writer in the field of medical zoology have made his name familiar to students of medicine the world over. His visit to our College of Medicine and his expressions of interest in its work and methods are significant of the standing it has already won and inspiring in the effort to attain higher rank.

The BULLETIN reproduces in this issue a photograph of the visitors taken on the University campus. It would be pleasant to give more extended notice of the other distinguished members of the party whose work and interests lie in allied lines of biological science, but space forbids transgressing the limits of the medical field.

DR. JAMES CARROLL

DIED IN WASHINGTON, D. C., SEPTEMBER 16, 1907

Dr. Howard A. Kelly in *Walter Reed and Yellow Fever* epitomizes the relation of Dr. James Carroll to the discovery of the method of transmission of yellow fever by the following:

"All the reports of the Commission bear Dr. Carroll's name as well as that of Dr. Reed, and in reading them we should always bear in mind that, while the experiments were planned by the master mind of the chief, the accuracy with which they were carried out and the care by which all possible precautions were taken to exclude every source of error are due to Dr. Carroll quite as much as to Dr. Reed."

Few who know well of the work of the Commission will underestimate the great value of the services of Dr. Carroll, but there are many who do not realize the part he played on the Yellow Fever Commission. His work at that time was characteristic of the man, and a glance at his life as a whole shows that from his early years he was earnest, steadfast, and quiet but thoro; what he accomplished against odds on the Yellow Fever Commission was only a repetition of his triumphs in earlier years when circumstances were adverse and opportunities but few.

Born in 1854 at Woolwich, England, he came to Canada at fifteen and lived as a backwoodsman for some years. In 1881 he enlisted in the United States army, and while a soldier began the study of medicine. From the University of Maryland in 1891 he received the degree of M.D. and did post-graduate work in Johns Hopkins Hospital from 1891 to 1893. Since that time he has been more or less continuously at work in connection with the Army Medical School in Washington.

He and Dr. Walter Reed were appointed by Surgeon-General Sternberg to investigate the bacillus icteroides of Sanarelli at the time when the latter claimed to have discovered the germ of yellow fever. When the Army Commission on Yellow Fever was appointed in 1900 Dr. Carroll was placed second in command to Dr. Reed, and from that time forward had most of the active management of the work in Cuba. Dr. Carroll himself suffered

from the first attack of yellow fever produced experimentally by the bite of a mosquito and was very proud of the fact; altho he says, "With a wife and five young children at home my thoughts during the serious part of the illness may be better imagined than described." There can be no question but that each member of the Commission had an important share in the results finally accomplished, but it is equally certain that Dr. Carroll well deserved his place second to Dr. Reed as he had been assigned.

Dr. Carroll's independent contributions to the literature of yellow fever were not numerous, but cover the entire subject, including the history, etiology, transmission, and treatment of the disease.

To us who mourn his death it is a matter both of satisfaction and regret that Dr. Carroll was signally honored during his lifetime for his great work; the misfortune lies in the fact that the honors came almost too late for him to taste of them to the full.

In October, 1902, tho past the age limit, he was made first lieutenant and assistant-surgeon in the Medical Department of the Army. In May, 1907, largely thru the efforts of the subcommittee, of which Dr. A. S. von Mansfelde was chairman, of the Committee on Medical Legislation of the American Medical Association, Congress ordered that he be commissioned as major and surgeon in the army. During the same month the University of Nebraska conferred upon him the degree of doctor of laws in recognition of his work.

It is sincerely to be hoped that the rewards which Dr. Carroll should have but did not receive will be given yet to his wife and children, who are none too adequately provided for. The people of this country and of Cuba owe to his memory and to his family much more than they will ever be able to pay.

H. WINNETT ORR, Lincoln.

COLLEGE NOTES

Dr. Wm. F. Milroy spent the month of August in New York.

Mr. Doyle Mulliken was elected president of the senior class.

Dr. Robert H. Wolcott was called East on account of the death of his father recently.

Dr. C. C. Morison, '03, of Omaha was recently called to Minnesota to testify in a railroad case.

At this writing Mrs. Dr. Henry B. Ward is very sick at the St. Elizabeth's hospital. Her condition is critical.

Dr. Franz Swoboda, '05, who had two years in the Douglas County Hospital, has located in Brainard, Nebraska.

Dr. G. C. Shockey, '02, of Melrose Park, Illinois, and Dr. H. J. Arbogast, '05, of Bartley, Nebraska, visited the College recently.

Dr. Heaney left recently for Heidelberg, where he will study under Alfons Rosthorn, from whence he will go to Vienna to continue his study.

Dr. E. J. Taggart, '88, from Birmingham, Washington, was in Vienna during Dr. Truelsen's sojourn there. He has not yet returned to America.

Dr. D. C. Isaacs, '03, went to Vienna last Christmas for a year's work in the eye, ear, nose, and throat. Before going to Vienna he had worked in Glasgow and in London.

Dr. Mayhew attended the anniversary celebration of his alma mater, Princeton, during the summer, following which he spent a month visiting the hospitals of the East, particularly in Philadelphia.

Dr. F. S. Owen attended the meeting of the American Academy of Ophthalmology and Oto-Laryngology, held in Louisville, Kentucky, September 26-28. Dr. Owen was made vice-president of this Society.

Dr. McDonald, '05, who for the last year has been working with Dr. McArthur at the Hanna mines in Wyoming, was given the medical work at the Superior mines. Dr. McArthur is looking for an assistant.

Dr. Francis Petr, '04, who during the summer moved to Nebraska, having sold his practice in Jansen, returned to Kansas. He is now located in Munden. Dr. Petr intends to go to Prague next year for post work.

Dean Ward spent July and August on Sebago Lake, Maine, and met unexpected success in his investigations for the U. S. Bureau of Fisheries on the parasites and parasitic diseases of the land-locked salmon, a famous species of game fish which is being rapidly depleted.

That Cupid has been particularly active among the members of the faculty of the College of Medicine is evidenced by the appearance of the marriage announcements of three of its members. In July Prof. W. A. Willard and Miss Blanche Snider were united in wedlock at Wilmette, Illinois. In September Dr. C. W. M. Poynter and Miss Clara Axtell were married in Nashville, Tennessee. At about the same time Dr. H. H. Everett and Miss Blanche Hargreaves were married in Lincoln. Drs. Everett and Poynter are spending their honeymoon in Europe.

Dr. J. D. Reid, '02, from Crab Orchard, Nebraska, while in Omaha during the Aksarben festivities, was sand-bagged one evening on the 24th street viaduct. When he became conscious he was below the viaduct on the railroad tracks and had one foot off. He was taken to the hospital and cared for by a member of the faculty. At last accounts he is doing well.

Dr. W. S. Milroy has been chosen president of the Medical Society of the Missouri Valley for the coming year. Dr. Milroy was a charter member of the Society which was organized in 1888, and has taken an active part in its conduct. The current number of the *Medical Herald* bears on its cover page a fine likeness of Dr. Milroy and contains in its text a well-deserved tribute to his personality and work. The next meeting of the Society will be held at Lincoln, March 8, 1903.

The Seventh International Zoological Congress met at Boston, August 19 to 24. The sessions of the Congress, which was the first to convene outside the limits of Europe, were held at the new buildings of the Harvard Medical School. The University of Nebraska was represented by Dean Henry B. Ward, Professor Robert H. Wolcott, and Professor F. D. Barker, all of the College of Medicine. Dean Ward was the official delegate of the University and of the American Zoological Society. He read on invitation two papers, viz., *The Influence of Migration and Hibernation on Animal Parasites*, and *The Influence of Civilization on Human Zooparasitic Diseases*.

A representative of the BULLETIN recently in communication with Dr. Thomas Truelsen concerning his experiences while abroad was again impressed by the almost unanimous favor with which Vienna is viewed by those who have been in Europe to enlarge their experience in medicine. Dr. Truelsen considers himself fortunate in having been directed to Vienna. He states, "It is the only place for an American to go for medical work because it is the only place where any attempt is made to give work—both didactic and clinical—in a systematic way." It is not uncommon to meet men who, thinking they would avoid studying German, had remained in London for work. Their verdict is that time spent there is practically wasted. Dr. Truelsen says, "The best time to work in Vienna is from September to Christmas (Christmas vacation about four weeks). Then from January to Easter (Easter vacation about four to six weeks). During the vacations most men travel, but it is a very bad time to visit other universities, because, if anxious to see big men, disappointment is sure to follow, since the big men do not 'come around' during vacations but leave their university work to their assistants." Dr. Truelsen thinks it is a great mistake to go abroad right after graduation or after hospital experience. "It is best to practice for three to five years; learn where you are weak or deficient. Right after graduation one does not know his weak spots, and right after a hospital experience one is apt to 'know it all.'" Expenses are not exorbitant. One hundred and eighty dollars per month is ample, and enables one to take as much work as is wise, travel a little, and buy a few books and instruments. "Those contemplating a trip abroad should study German before going. Study a vocabulary, learn to read fluently and to understand the spoken language. Don't waste your time in trying to learn to speak it." Dr. Truelsen studied internal medicine and took work that would be helpful in diagnosis. He met Dr. Paul Ludington in Vienna, who was studying medicine, and especially pediatrics. Later Dr. Ludington went to Marburg. He will resume his work with the College in Omaha soon and will limit his practice to diseases of children.

To those who have the interests of the College of Medicine at heart there is no more pleasing retrospect than the contemplation of the rapid steps thru which the College has reached its present position, and nothing more hopeful and encouraging for future progress than the quiet but steady alterations that daily mark the College's growth. The following quotation, taken from the *Daily Nebraskan*, marks one aspect of this growth:

"The College of Medicine at the University is one of the departments in the school that has shown a decided increase in attendance over last year. The registration in this department began at the same time as the enrolment in the other courses, but many advanced students came in late, and not until the present time has the status of the attendance been known. A part of the increase in enrolment may be due to the fact that this fall is the last opportunity which students will have to secure at the University the old four-year course. On January 1, 1908, the entrance requirements become one year of college work above the high school course. It is not necessary, however, that this preparatory year must be spent at this University, but it must be in some institution of collegiate rank, where the prospective student must take work in chemistry, German, and animal biology."

But there are other indications of the growth of the College. These consist of very welcome additions to the laboratory space, the laboratory equipment, and to the scientific literature of the library. These may be briefly enumerated. With exceptions for botany, entomology, and forestry, the entire three floors and basement of Nebraska Hall are now given up to medical subjects. The various laboratories have been brought together so that they are not separated as they were formerly, and each floor has its own lecture room. There remain but two exceptions. The anatomical laboratory still occupies the top of Mechanic Arts Hall. It has been enlarged by the addition of one room. A fine feature of the new arrangements is the addition of private research rooms to many of the laboratories and a lavish distribution of electric lights. A conservative estimate for repairs and improvements in Nebraska Hall would amount to \$6,000. The combined new additions to the equipment of the laboratories is not less than \$6,000. The histological laboratory has received a series of new microscopes of the Leitz make. Two new microtomes have been added to those already on hand. One is of the latest improved Minot rotary type; the other is a Minot precision microtome. The histological laboratories now consist of a general laboratory devoted to histology and embryology, a technic room used jointly with medical zoology, and a private research laboratory for Professor Willard. Medical zoology also has increased laboratory facilities. In addition to the general laboratory for students there is a private research laboratory for Professor Barker and another designed for advanced workers in helminthology. New microscopes are also added to the equipment here to provide for the increased numbers in the classes. A new lecture room for these laboratories on the same floor of Nebraska Hall is fitted up with fine new lecture chairs and table, a place for projecting lantern, a chart rack, etc. It is a well-lighted, commodious, and comfortable lecture room, well adapted to the requirements of a meeting hall for the Medical Society.

The department of bacteriology and pathology has now a general laboratory devoted exclusively to medical students, another for all other students of the University, and a private research laboratory for Dr. Waite separated from the general laboratory by a commodious office. The lecture room on the same floor remains as it was, but the Dean's office has been converted to a laboratory to be used by Drs. Lehnhoff, Mayhew, Orr, and Everett. The equipment of the bacteriological laboratory has been

augmented by the addition of a Latapie animal board, a Rabe shaking apparatus, by five Vaughan's collapsible animal cages, and a large dry heat sterilizer in which the animal cages can be sterilized. The equipment of stains is undoubtedly the most complete in the state. The departments of pharmaco-dynamics and physiology have also largely increased laboratory facilities. The laboratory floor space has been almost doubled. The laboratories now consist of a series of five rooms, one of which is a joint demonstration room and another a joint stock room. The equipment has been augmented by the addition of numerous pieces of apparatus. The most important are a myocardiograph, a special anesthetizing bottle, an ordinary pair of scales for weighing animals, a Staudinger balance, an Edelmann Saiten-galvanometer, a Beckman freezing apparatus, some more of the Harvard apparatus, and numerous smaller pieces for class use. Finally, it may be stated that a new animal house has been started, adjoining the old one.

Thru the kindness of Dr. W. K. Jewett the BULLETIN is able to report the following additions to the library facilities of the College: There are among the new books complete sets of Arch. f. Expt. Path. u. Pharmacol.; Gegenbauer's Morphologisches Jahrbuch; Therapeutische Monatsberichte and Ergebnisse d. Physiologie. Altogether over three hundred new volumes are to be added to the medical library.

The Pathological Club of the College of Medicine has for the present year made a decided departure from its customary method of conducting its meetings.

A program committee has been given full power of outlining a general scheme of work for the collegiate year. The first program, amended and revised by the Club, follows below, and it is hoped that it may be carried out in its entirety. At this writing two successful meetings have already been held. The first, a business session, was held at the Lincoln hotel, where, as a preliminary to the more serious work, the members of the Club indulged in an enjoyable repast. Dr. H. Winnett Orr succeeded Dean Ward as president, Dr. A. E. Guenther took the place of Dr. H. H. Everett as secretary, and Dr. R. G. Clapp remains treasurer. Meetings are to be held weekly, and are in general of three types: (1) social sessions held in connection with a dinner, after which formal papers are to be presented; (2) reports on current literature; and (3) demonstrations. The first demonstration of the year was given by Dr. Lyman. It is clearly appreciable, from this first meeting of the third type, that the demonstrations surpass the other meetings by far in value, but they are in their preparation so time-consuming that it will require all the enthusiasm of which the members of the Club are capable to bring the demonstrations into readiness at the proper time. Alumni and students of the College of Medicine are urgently requested to attend the meetings of the Club, and every assurance is given that they will be most welcome.

The program of the year is as follows:

PROGRAM

1. Business Session. Election of Officers. Report of Committees.
2. Demonstration—Effect of Vagus Stimulation (weak and strong currents), Chloroform, Ether, Suprarenal Extract, Alcohol, Digitalis, Caffeine, and Digitalis (toxic doses) on Mammalian Heart, Dr. R. A. Lyman.
3. Report on Current Literature—Parasitology, Medical Zoology, and Tropical Diseases, Dr. H. B. Ward. Bacteriology and Pathology, Dr. H. H. Waite.
4. Social Session. Papers—Simplified Methods of Bedside Clinical Instruction, Dr. J. M. Mayhew. The Physiological Aspects of Shock, Dr. A. E. Guenther.

5. Demonstrations—The Anatomy and Physiology of the Human Foot and Leg, Dr. H. Winnett Orr. Some Rare Medical Books, Dr. H. Winnett Orr.
6. Report on Current Literature—Histology and Embryology, Prof. W. A. Willard. Mental and Nervous Diseases, Dr. L. B. Pilsbury.
7. Social Session. Papers—An Analysis of the Views of Arrhenius and Ehrlich Concerning the Nature of Toxins, Dr. Benton Dales. The Relation of the Vessel Wall to Hydremia, Dr. H. J. Lehnhoff.
8. Demonstrations—The Staining Reactions of Gland Cells in Different Phases of Physiological Activity, Prof. W. A. Willard. The Effects of Fatigue and Disease on the Structure of Nerve Cells, Dr. L. B. Pilsbury.
9. Report on Current Literature—Pharmaco-dynamics and Therapeutics, Dr. R. A. Lyman. Pediatrics, Orthopedics, and Medical Jurisprudence, Dr. H. Winnett Orr.
10. Social Session. Papers—The Ductless Glands, Dr. R. H. Wolcott. The Physiology of Accommodation, Dr. L. A. Lindquist.
11. Demonstrations—Life-history of the Hookworm and Microfilariae from Human Blood, Dr. H. B. Ward. Lysins, Precipitins, and Agglutinins, Dr. H. H. Waite.
12. Report on Current Literature—Physiology and Psychology, Dr. A. E. Guenther. Internal Medicine and Diagnosis, Dr. J. M. Mayhew.
13. Open Session.
14. Demonstration—Simple Methods in Detecting Adulterations in Foods and Drugs of Use to Physicians, Dr. Samuel Avery.
15. Report on Current Literature—Anatomy, Medical Legislation, and Medical Education, Dr. R. H. Wolcott. Ophthalmology, Otology, Laryngology, and Rhinology, Dr. L. A. Lindquist.
16. Social Session. Papers—The Origin of Sex-cells in Vertebrates and the Development and Differentiation of the Sexual Glands, Prof. W. A. Willard. The Metabolism of Uric Acid, Dr. L. B. Pilsbury.
17. Demonstrations—Regeneration of Nerves, Dr. J. M. Mayhew. Artificial Heart-block in Dogs, Dr. A. E. Guenther.
18. Report on Current Literature—Physical Chemistry and Toxicology, Dr. Benton Dales. Electro-therapeutics, Obstetrics, and Gynecology, Dr. H. J. Lehnhoff.
19. Social Session. Papers—The Nature of Tolerance, Dr. R. A. Lyman. The Comparative Anatomy and Embryology of the Foot with Reference to the Causation of Malformations, Dr. H. Winnett Orr.
20. Demonstrations—The Neutral Reaction of the Blood as Shown by the Gass-kette, Dr. Benton Dales. Meltzer's Method of Rectal Anesthesia, Dr. H. J. Lehnhoff.
21. Report on Current Literature—Organic and Physiological Chemistry, Dr. Samuel Avery. Internal Medicine and Diagnosis, Dr. H. H. Everett.
22. Social Session. Papers—The Organism as a Machine, Dr. R. G. Clapp. The Present Status of Abdominal Drainage, Dr. C. W. M. Poynter.
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